SN: 043-0027

Bridge Condition Report

DISTRICT: 2

ROUTE: IL. Rte 84

SECTION: 103BR-2

COUNTY: JoDaviess

STRUCTURE NUMBER: 043-0027 (EXISTING)

LOCATION: N edge of Hanover, IL.

PREPARED BY: Kenneth S. Couperus

DATE PREPARED: April 2007

PROPOSED LETTING DATE: OUT

TABLE OF CONTENTS

I. Geographical & Administrative Data:

Structure Number: 043-0027
County: JoDaviess
Route Carried: SBI 80 (IL. Rte 84)
Feature Crossed: Duke Creek
Section: 103-B (original) 103BR-2 (existing)
Station: 242+45.5 (center of structure)

Roadway Classification: Other Principal Arterial
Design/Posted Speed: 30 MPH/ 30 MPH
ADT (current/future): 2005 (2150) / 2026 (2350)
ADTT (current/future): 2005 (280) / 2026 (306)
DHV: 215
Inventory Rating HS: 23.3
Operating Rating HS: 37.8
Sufficiency Rating: 76.1

Construction / Reconstruction / Repair History:

Construction: The original structure was built in **1930** as a single span PPC Deck Beam superstructure under SBI 80, Section 103-B with HS 20-44 design loading.

Bridge Reconstruction: During **1982** the old deck, superstructure, and abutment caps were removed and a new PPC Deck Beam superstructure was added under section 103BR-2, CN: 35138.

II. Physical Description of Structure:

Structure 043-0027 is a one span Prestressed Concrete Deck Beam superstructure with 11 beam lines sitting on two closed reinforced concrete abutments founded on untreated 10, 12 and 15 ton timber piles with zero skew angle. The wearing surface consists of approximately 2 inches of bituminous concrete over a waterproofing membrane system.

The back-to-back of abutment length is 44'-6" and the out-to-out deck width is 33'-0".

The structure provides for one 12' traffic lane North and Southbound with 3' bituminous shoulders on each side. The structure is 32'-8" wide face to face of bridge rail. There are no sidewalks. The railing consists of a single steel rail type S-1 mounted on W6X25 steel posts bolted to the fascia.

The existing structure is located on tangent horizontally and is near the sag of a vertical curve. The approach roadway template at both ends is a 24ft roadway with 3ft aggregate shoulders on each side.

The slope walls are not protected. The approach slabs rest on concrete footings.

III. Field Inspection & Physical Evaluation:

Wearing Surface: The 2" bituminous wearing surface is 25 years old and in **good** condition.

The bridge rail and guardrail ends are substandard.

There is a 2 ½" PJS joint at the South abutment that is paved over and a fixed elastic joint at the North abutment.

Superstructure: The superstructure is 25 years old and in **fair** condition. Beams 5 and 7 have spalls with exposed prestressing steel within the center half of the span and Beam 11 (fascia) has a delamination/spall on the web and soffitt at the South end in the end quarter of the beam. (See photos and soffitt survey in the attachments).

The approach pavements are being heavily undermined by erosion on all four corners at the abutments leaving large voids under the approaches. The south approach pavement has a wide (1/2") longitudinal crack running the entire length of the approach in the SB lane about 4 feet from the center line.

Substructure: The substructure is in **satisfactory** condition. Concrete in the abutments is generally sound but heavily discolored by water staining, mold and graffiti. There is a medium two foot long horizontal crack in the North abutment cap under beam one.

The slope walls are unprotected soil. The NE and SW wing walls are in good condition however the NW and SE wing walls each have a medium vertical crack running the entire height of the wall near the center.

Inspection History (NBIS Ratings):

Year	Deck (58)	Super (59)	Sub (60)
2006	5	5	6
2005	5	5	6
2004	5	5	6
2002	6	6	6
2000	6	6	6

Geometric/Hydraulic Data:

The Bridge Deck Geometry rating (Item 68) is rated a 4 based on current ADT, number of lanes and deck width which is classified as meets minimum tolerable limits to be left in place.

There are no documented incidences of overtopping or flooding at this structure.

IV. Potential Scope of Work Determination & Analysis:

Option 1: Rehabilitation: Remove bituminous wearing surface, replace 3 to 4 beams, drill holes in approach pavements, seal ends near the abutments and pump flowable mix to fill large voids created by erosion, update bridge rails and place rigid concrete overlay with bituminous approaches.

Option 2: Bridge Replacement: If the road template is anticipated to be widened or realigned in the next 20 years, the load rating of the superstructure mandates, or the cost analysis dictates, a new structure will be required. (To be determined by others)

V. Discussion and Recommended Scope of Work:

Based on the fact that the substructure was already rehabbed once in 1982, the deck beams have 25 years of chloride accumulation in them and the cost of removing and replacing 3 to 4 beams, repairing the erosion problem under the approaches (would have to drill through the approach pavement, seal ends and pump full of flowable mix), updating the bridge rails and placing a five inch thick rigid concrete overlay with bituminous approach tapers will exceed the 60% limit of a new structure and when completed would still have a structure that is geometrically classified as minimum adequacy to be left in place and founded on 77 year old untreated timber piles and abutments we recommend complete structure replacement.

Traffic Control: Because this is a deck beam superstructure, the traffic control during construction should be evaluated during Phase I in programming using TMA-Traffic Management Analysis. (Final recommendation to be approved by Traffic Management) Note: for staging purposes-both NB and SB are about in the same condition.

ATTACHMENTS:

Attachment A:	Location map
Attachment B:	IDOT Master Structure Report
Attachment C:	Bridge Inspection Report
Attachment D:	PONTIS Inspection Report
Attachment E:	Soffitt Survey
Attachment F:	Structure Photos
Attachment G:	Abbreviated Existing Plans
Attachment H:	Cost Estimates